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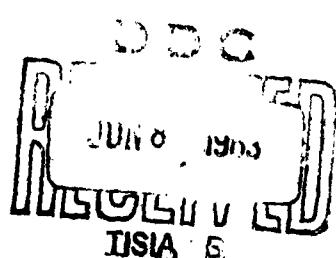
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USSR Industrial Development

SOVIET CHEMICAL INDUSTRY

No. 64



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USSR Industrial Development

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This serial publication contains translations of selected articles on the chemical industry in the Soviet Union, on the specific subject indicated in the table of contents below. Complete bibliographic information accompanies each article.

Table of Contents

	<u>Page</u>
Crash Program for Construction Projects of Large-Scale Chemical Industry.....	1
Progress in the Chemical Industry of Tambovskiy Sovnarkhoz.....	4
Production of Synthetic Diamonds in the Ukraine.....	8
Lagging Production of High-Strength Cord at the Kamensk-Shakhtinskiy Combine.....	13
Lagging Construction of the Barnaul Rubber-Asbestos Combine.....	15
Unlimited Production Possibilities of the Enterprises in Kokhtla-Yarve.....	17
Technical Progress is the Vanguard of the Seven-Year Plan.....	21
Chemical Industry and Chemization of Animal Husbandry.....	26
Production Innovators at Alcohol Plants.....	32
To Expand the Production of New Glass Wares.....	35

CRASH PROGRAM FOR CONSTRUCTION PROJECTS OF LARGE-SCALE CHEMICAL INDUSTRY

[Following is a translation of an article by D. Shishkarev, Z. Alekseyeva, P. Starostin, and N. Koshelev in the Russian-language newspaper Izvestiya, Moscow, 16 Jan 63.]

A chemical plant, among other most important enterprises, is under construction in Stavropol' on the Volga. It is scheduled to be the country's first and largest supplier of phosphorus compounds. Here the plant will produce fertilizers for agriculture, organophosphorus compounds for the production of rubber, plastics and lacquers, for the production of synthetic detergents and products for the food and other industries.

The new enterprise is, therefore, of important significance for the national economy. The construction of the plant was started in 1958. The target dates for the startup of its capacities have been established more than once. Tremendous funds have been invested in the objects, but to this day, not a single shop has been completed.

According to the original variant, the first stage of the plant included a shop complex for the production of phosphorus fertilizers. Also, it was envisaged that it would operate with raw materials shipped in, but this is extremely unprofitable, requires distant shipments, and was even not supported by raw-material resources. Nevertheless, the construction project of this complex was planned and accomplished prior to 1960 and then was shut down. The invested funds were not put to work. The efforts of the builders and the material-technical resources were switched to the construction of another shop. The fourth quarter of 1960 was set as the target date for its startup. But even this time, the raw-material resources were not taken into account and the shop, if it had been completed, would have

idled because of non-supply of raw materials.

Only after the energetic intervention of the Council of Ministers USSR did the planners "find," finally, an intelligent solution: they started the construction of a phosphorus and phosphoric-acid complex of shops which would supply the raw materials for all the subsequent processes envisaged by the general plan of the plant.

But now the planners as well as the All-Union Council of National Economy have assigned to the chemists truly a puzzler. The startup of the shops of this group was planned at first for the fourth quarter of 1962. There was, however, a hitch in the financing of the construction project. The builders overfulfilled the plan of the past year, but not a single object has been placed in operation.

The technical documents of the complex were made by the "Lengiprokhim" Institute in a hurry; many problems were not solved or were solved incorrectly and this caused many alterations in the course of the construction. The supply of the plant with equipment was at first being accomplished by the "Soyuzglavkhimkomplekt" and now by the "Glavkomplektoborudovaniye" of the All-Union Council of National Economy, also not much better. The equipment deliveries are planned without any consideration of the target dates for the startup of the objects and the true requirements of the enterprise.

Here are examples. Three gas blowers which, in accordance with the installation schedule, were needed in the second quarter of last year, were allocated only in the last quarter. One hundred and twenty four instruments for control and automation were, in general, not allocated to the plant for 1962, while the delivery of some of these is not being planned even for 1963. To this, it is necessary to add that certain enterprises, as the Novosibirsk Plant of Electrothermal Equipment, are violating the agreed target dates for the delivery of equipment or are producing it with serious defects and incomplete.

"Kuybyshevsgidrostroy" is also not favoring the construction highly. The plant has started the construction of 84 objects and only 14 of these have the construction completed. Kuybyshevskaya Oblast Committee of the Party approved a schedule for completing the work of the first stage. But with respect to a whole number of the most important positions, it was not met.

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In the near future the first stage of the plant will go on stream, although with a great delay. But the site has many other matters, first of all, for completing the construction of the same first stage. After all, the phosphorus and phosphoric-acid shops could in the meantime operate at half the designed capacity: only one ore-thermal furnace has been installed therein and even this has not been fully equipped by the Novosibirsk Plant. And the Novosibirsk workers are promising to deliver the second furnace in the third quarter of this year. The installation of a furnace is a complex matter and this requires not less than half a year. But the startup of the shops at full capacity is envisaged for the fourth quarter. How are the chemists to find a way out of this situation?

It seems that the All-Union Council of National Economy and the supplying organizations are not concerned about this. Is it not time for the All-Union Council of National Economy and the Sredne-Volzhskiy Sovnarkhoz to start running matters at the most important object in a state manner, just as this was required by the November Plenum of the Central Committee of the Party?

PROGRESS IN THE CHEMICAL INDUSTRY OF TAMBOVSKIY SOVNARKHOZ

[Following is a translation of an article by P. Zabavnikov in the Russian-language newspaper Izvestiya, Moscow, 19 Jan 63.]

The Plant of Rubber and Technical Products is a child of the seven-year plan: it grew up in front of you. During the last four years production increased approximately two and a half times.

Such a rate is not a miracle and not an accident. Its base is the decisions of the May Plenum of the Central Committee of the Party, the constant attention of the Party and Government toward the chemical industry, and the creative, selfless work of people.

The plant was growing, but life required more: to raise the production capacities, to mechanize and automate more widely the technological process, and to introduce innovations. The production people developed detailed, substantiated measures. They were thoroughly examined in the bureau of the oblast Party committee.

But good intentions and good plans alone are not enough. In the shops they installed within a short time and modernized over 100 units of technological equipment and they perfected the processes of hot molding of shapes. As a result, labor productivity increased by almost 13 percent during a year.

The personnel are striving for high rates of technical progress. Specialization of shops has made it possible to increase twofold in four years the output of friction rings and that of brake facings - 2.5 times. Here they are persistently introducing a new technological process -- the production of molding mixes by the method of dry mixing in rubber mixers. What does this give? In the first place, it dispenses with the need of such products as benzine and

ethyl alcohol and, in the second place, the time required for the preparation of the molding mixes has been reduced tenfold. And is it of little importance that at the same time the working conditions are improved and rejects are reduced? With complete changeover to dry mixing, the economic effect will reach two million rubles. For this work, the personnel have been awarded a diploma by the Exhibit of Achievements of the National Economy.

Further development of the enterprise is being conducted on the basis of the plan of construction and reconstruction as developed by the Yaroslavl' Affiliate of "Rezinoproyekt." In the first shop, the replacement of old presses by more powerful ones with automatic control has, for example, already been completed. The reconstruction of the department of mechanical processing of facings has been started.

And such a scope, such rates are characteristic of many Tambov enterprises. During four years of the seven-year plan, the total volume of gross production of the chemical enterprises increased one and a half times, while by the end of 1965, it will increase 2.5 times.

More and more fighters are joining the powerful detachment of the "large-scale chemical industry" in the Tambov area. The image of the chemical industry in the oblast is shaping up more clearly: production of new products for plastics, lacquers, paints, synthetic resins, as well as plastic products.

Here are only a few facts. During the years of the seven-year plan, a shop for the production of diketone went on stream at the aniline-dye plant. The national economy of the country began to get an intermediate which is extremely necessary for the production of color- and light-resistant dyes of yellow tinges and medicinals. But the important thing is that it will replace such a high-cost and critical raw material as acetoacetic ester. The first stage of a complex of shops for the production of phthalic anhydride went on stream; this is a very important raw material for the production of resins, for the lacquer and paint industry, and for diverse types of plastics. This year will see the startup of a complex of shops for the production of maleic anhydride. This intermediate is necessary for the production of synthetic resins, high-strength plastics, and glass plastics. It is known that the high mechanical strength and thermal resistance, small

specific gravity, excellent electrical insulation properties, and other qualities of the glass plastics make their field of application truly unlimited.

The Tambov chemists are proud that they organized the production of plate froth-plasts. This heat insulating material has found wide application as a light filler in reinforced construction, aircraft and ship building, and in the furniture industry.

The mechanical boiler shop of the plant, where polyethylene and polychlorvinyl pipes are produced, is increasing in capacity. This is the largest shop in the country and in Europe. Polyethylene pipes are 10 times lighter than steel ones, they are not subject to corrosion, they are chemically stable, and they withstand pressure up to 10 atmospheres.

Chemistry is bringing invaluable possibilities to the national economy. And the people who are engaged in this branch of industry understand that they are in the forefront of technical progress. They are giving their energy, knowledge, and acumen for the further perfection of production and for the preparation of the most progressive synthetic materials. At the aniline-dye plant alone over 400 innovations were introduced. At the asbestos and rubber products plant the innovators saved last year over 250,000 rubles.

But this does not yet mean that everything is all right, that all possibilities have been utilized. No, there is a mountain of work; the latent reserves are also sufficient. Even at the foremost plants there is still much manual work.

The capacities of the individual shops are being utilized very poorly, not in a business-like manner. Let us take, for instance, the production of polyethylene pipes. It turned out to be a plant within a plant -- chemical production at a machine building enterprise. It is possible that precisely such an unusual situation has led to a situation where the leaders of the enterprise could not in time bring up the reserves and assure the new shop with water for technical needs. And with the "help" of the Gosplan of the Federation, the problem of the overall development of pipe production has been completely eliminated. It is sufficient to state that funds are not being allocated which are necessary for the construction of a fittings shop

without which the possibilities for the use of the pipes become restricted.

But even under these conditions, the plant even now produces about 6,000 tons of pipes, while the Gosplan RSFSR established a goal of 2,000 tons for this year. Besides, the main argument is a shortage of raw materials. But is this actually so? Yes and why is it precisely so? After all, the most valuable imported equipment will remain idle; at the same time, far less valuable products are being made from polyethylene.

Sometimes, as strange as it seems, the Gosplan of the republic establishes target dates for the startup of new enterprises but it does not provide funds for their construction. Thus, the cost of the Uvarovka Superphosphate Plant is tens of millions of rubles, the target date for the startup of the first stage is 1965, while the allocations for the construction and installation operations amount to one million rubles. It is necessary to assume that the planners will be better able to calculate when it will be possible to place the plant in operation in accordance with such a miserable dietary portion. The construction of the plant is also being delayed because the planners -- "Giprokhim" of the State Committee for Chemistry and its numerous subcontractors are poorly supplying the objects with technical documents.

"It is necessary, finally," said at the November Plenum of the Central Committee of the Party, N. S. Khrushchev, "to put an end to the superficial and shorthanded approach to the development of the chemical industry, exhibit statewide scope, and with economic know-how evaluate the outlook and tremendous advantage which the national economy will get from the development of the chemical industry."

The examples cited above only confirm that the underestimation of chemistry must be ended more decisively.

The decisions of the November Plenum of the Central Committee obligate the Tambov chemists to startup more rapidly and master the existing capacities, and continuously increase the output of the most progressive synthetic materials in order to replace critical materials with these. There is no doubt that the rearrangement of the Party leadership of the national economy will make it possible to solve more concretely the problems of the development of the chemical industry.

PRODUCTION OF SYNTHETIC DIAMONDS IN THE UKRAINE

[Following is a translation of an article by V. Bakul' in the Russian-language newspaper Izvestiya, Moscow, 20 Jan 63.]

The exceptional and unusual properties of diamond have moved it to the forefront of all minerals known to man. This is the best of all precious stones, the basis of the jewelry business in the entire world; with respect to strength of lustre and iridescence, it has no equal. Diamond is justly called "the king of hard bodies." This is the hardest mineral of all known in nature and of those materials obtained artificially.

Diamond drills, cutters, drill bits and chisels for drilling the strongest rocks, instruments for dressing grinding wheels, tips for instruments to measure the hardness and cleanliness of a surface, saws for cutting granite and marble, diamond-abrasive wheels, disks for cutting semiconductor materials, bearings for particularly accurate instruments and marine chronometers -- this is a far from complete list of the use of diamonds in technology.

The successful development of modern precision technique, the increase in speeds and loads, the use in industry of hard alloys, high-strength, difficultly worked steels and synthetic materials, the drilling of deep and super-deep boreholes are unthinkable today without the wide use of diamonds.

However, diamond is a very rare mineral. In the richest deposits the content of diamonds does not exceed one millionth of one percent.

The production of diamonds in the entire capitalist world during the five years from 1956 through 1960 amounted, on the average, to 24 to 28 million carats per year. (A carat is a unit of weight for precious stones and is equal

to 0.2 gram). This is 180 to 200 times less than the production of such a precious metal as gold in the capitalist world. The entire annual world output of diamonds can be carted away on a five-ton truck.

People have for a long time been dreaming about the production of artificial diamonds. However, the nature of diamond has for a long time represented a riddle for science.

Now every schoolboy knows that diamond and graphite are chemically pure carbon and are only modifications which differ in the distribution of the atoms in the structural lattice.

Scientists have easily obtained graphite from diamond, but they have been unable to obtain diamond from graphite despite numerous attempts.

In accordance with the existing theory, diamonds mined by man in the surface of the earth's crust were formed within the bowels of the earth at a distance of 200 to 300 kilometers from its surface where a pressure up to 200,000 and more atmospheres and a temperature of the order of 2,500 to 3,500 degrees reign. In order to convert graphite into diamond under laboratory conditions, it was necessary to create a unit capable of simultaneously developing high pressure and temperature.

At the 22nd Party Congress, the president of the Academy of Sciences USSR, Academician M. V. Keldysh, reported to the delegates of the congress that, as a result of the achievements of Soviet science in the field of super-high pressure, Soviet scientists and physicists have developed a method of producing synthetic diamonds. Simultaneously with this, the presidium received a telegram report addressed to the First Secretary of the Central Committee of the Party, Comrade N. S. Khrushchev, that the scientists and engineers of our institute have, on the basis of this method, developed the technology of pilot-plant production of artificial diamonds and, as a gift to the congress, the first lot of diamonds has been produced.

The year that passed since the publication of the report was a year of persistent work for the personnel of the institute.

A great event in the life of our personnel was the visit to the institute and its experimental plant by

Comrades N. S. Khrushchev and N. V. Podgornyy.

Nikita Sergeyevich was deeply and universally interested in the outlook for the development of the production of synthetic diamonds, their cost, and the set-up of the work for the introduction of the diamonds. Comrade N. S. Khrushchev advanced a number of suggestions about the need for organizing within the shortest period of time of centralized production and introduction into all branches of industry of highly effective, progressive diamond and super-hard instruments.

The personnel of the Ukrainian Scientific Research Institute of Synthetic Super-Hard Materials and Instruments have during the past year developed the technology of the industrial production of synthetic diamonds, high-output equipment for converting ordinary graphite into the hard mineral diamond has been organized, and the production of synthetic diamonds and instruments therefrom has been organized. Our artificial diamonds cost considerably less than the natural ones.

In January of this year during a visit to the exhibit of the new technology, Nikita Sergeyevich Khrushchev said, "Now we have organized the output of artificial diamonds. Our industry will produce as many of them as are necessary."

There they lie before us, Ukrainian diamonds! Here is an entire treasure: packaged in 500, 1,000, and 2,000 carats in special containers, the diamonds stand in beauty and, along with them, shining with the smoothness of their surface, are diamond circles of different form and size made from Soviet synthetic diamonds, pencils for dressing of wheels and other instruments. And there is a diamond needle file, a long cherished dream of every gage maker.

Synthetic diamonds, with respect to their capacity to function, are not only not inferior to the natural diamonds of the best African and Yakut deposits; they even excell the latter. Thus, abrasive wheels from synthetic diamonds are 30 to 60 % more productive than those of natural diamonds.

As is known, the bulk of diamonds is utilized in industry as a diamond powder for the production of diamond-abrasive instruments (diamond wheels, lapping machines, honing heads, needle files, and pastes). They are used for final finishing and lapping of the most accurate components

of machines, mechanisms, and instruments that are made of specially hard, brittle and difficultly worked materials, for working optical and technical glass, watch and instrument jewels, as well as for sharpening and lapping of super-hard instruments. For these purposes, according to world practice, up to 75 percent of all the diamonds used in industry are consumed.

The requirement of all the leading branches of our industry for diamond-abrasive instruments can be completely satisfied by synthetic diamonds. In its turn, the use of diamond-abrasive sharpening will make it possible to considerably expand the output, the field of application, and the effectiveness of the utilization of super-hard instruments, in particular multi-edge and complex profile for working metals, wood, plastics, and ceramics.

The service life of instruments will thereby be increased scores of times.

The cleanliness of surfaces treated with such instruments will increase two classes, which will make it possible in many cases to dispense with the subsequent high-cost grinding or, at least, sharply reduce its labor consumption.

The primary task of metal working enterprises in the utilization of synthetic diamonds is the introduction of diamond sharpening and lapping of the entire, newly produced and resharpened hard-alloy instruments.

The use of artificial diamonds for the production and final processing of specially accurate cylinders and rubbing couples is promising. This will not only greatly increase the efficiency of the final processing, but will also lead to a considerable increase in the dimensional accuracy and accuracy of the geometric form of the opening with a higher class of cleanliness of the surface being processed.

All this will, in the final analysis, lead to a two-fold increase in the service life of linked rubbing couples. And this means that a motor vehicle, tractor, compressor, and many other machines will operate at least twice as long as now prior to capital repair.

Now it is necessary to develop with a wide front of the institutes, laboratories, and departments the scientific research work in order to unearth new, effective fields of

application of synthetic diamonds.

The State Committee for Automation and Machine Building should accelerate the work of planning and organizing the production of sharpening and grinding tools and other equipment of the latest designs, intended for the use of diamond-abrasive instruments as well as to solve the problem of the centralized production of standard assemblies for the modernization of the existing equipment at enterprises.

The wide utilization of synthetic diamonds in industry will give a considerably growth in labor productivity and will give our country a great economic effect measured in hundreds of millions of rubles, will facilitate the growth of production know-how, improve the quality, and increase the service life of equipment and instruments being produced.

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LAGGING PRODUCTION OF HIGH-STRENGTH CORD AT THE KAMENSK-SHAKHTINSKIY COMBINE

[Following is a translation of an article by V. Lobachev, M. Khoperskiy, V. Yermilova, P. Levin, and A. Vinogradov in the Russian-language newspaper Trud (Labor), Moscow, 16 Jan 63.]

In accordance with the reconstruction plan, a new acid station, contact evaporator, crystallization unit, pumping station, and cooler should be built at the Kamensk Artificial Fiber Combine. Besides this, an addition is to be built to the chemical shop and much complex equipment is to be installed. Specialists have estimated that all the expenditures will be recovered in the course of a year, for the production of high-strength cord will correspond to a one and a half-time increase of production.

However, the leaders of the former Rostovskiy Sovnarkhoz have underestimated the significance of the combine's reconstruction and have shown indifference toward the important construction project. They accepted the fact that the State Committee for Planning Artificial Fiber Enterprises delayed the issue of technical documents. They were not disturbed by the fact that during 1961 only 60 percent of the funds allocated for the reconstruction were spent.

Strange as it may seem, the deputy chairman of the former Rostovskiy Sovnarkhoz, Comrade Tsaruk'yan, gave an order to the contractor -- No 5 Construction Trust -- to fulfill only half of all the work. The other half was, in accordance with a decision by Comrade Tsaruk'yan, to be done by the combine's efforts.

This idea was beforehand doomed to failure because the combine did not have the production base or the technical means. What then happened? Only the foundation ditch has so far been dug on the place of the acid station. The

target dates for the construction of other objects have not been met. Equipment for high-cost units is already lying at the combine for several months.

It is necessary to say that, in general, the important construction project has suffered many misfortunes because the sovnarkhoz was the customer and the contractor. Instead of strengthening the No 5 Construction Trust which was in charge of the reconstruction of the artificial fiber combine, the sovnarkhoz leaders have in essence been avoiding an increase in the volume of the work.

Have any changes taken place now? No. The sovnarkhoz allocated such a sum of money for the construction and installation work that it is small even for the first stage of the reconstruction. And it is surprising that the All-Union Council of National Economy and the State Committee for Chemistry of the Council of Ministers USSR are accepting this.

It is necessary to speed up the delivery of new equipment that is needed by the combine for the production of high-strength cord. The mercerization processes, for example, have become outmoded. They should be replaced by continuous apparatuses by means of which it will be possible to mechanize the process and improve the quality of production. But the Kiev "Leninskaya Kuznitsa" Plant is failing to deliver these apparatuses.

Several control posts have now been established at the Kamensk Combine, which will follow the production at each object. It is necessary, in our opinion, to organize such posts also at enterprises which supply equipment and materials for the reconstruction of the combine. Public control will, without a doubt, help the Kamensk chemists to organize more rapidly the production of high-strength cord that is needed by the technical rubber industry.

LAGGING CONSTRUCTION OF THE BARNAUL RUBBER-ASBESTOS COMBINE

[Following is a translation of an article by N. Shipulin, G. Vedukhin, and V. Zernov in the Russian-language newspaper Trud (Labor), Moscow, 18 Jan 63.]

Our Barnaul Rubber-Asbestos Combine is a project of great importance. The enterprise will produce and rebuild motor vehicle tires, make rubber and asbestos-technical shapes, and supply raw materials for the tire industry.

Last year it was planned to place in operation the first two plants. But the builders failed to meet the timely startup of the second stage of one of these -- the carbon black shop. They left the place as far back as last year. But there is a mountain of work here to be done. The manager of the "Stroygaz" Trust, Comrade Ivkin, and the chief of the construction administration of the former Altayskiy Sovnarkhoz, Comrade Geronimus, are somehow not worried by the fact that, because of the fault of the builders, the national economy will not get tens of thousands of tons of rubber products.

There are fears that the production of semiactive carbon black will not be organized even next year. Here are the facts. The building of the tire repair plant -- the second starting object of the combine -- was essentially constructed as far back as autumn. But the enterprise has not been placed in operation to this day. The heat line and the water line have not been connected to the building; the compressor station and many other things are not ready.

How can this intolerable slowness be explained? It turns out that the builders consider the finishing operations disadvantageous. They do readily and rapidly that which pays much: laying of the foundation, erection of the walls,

laying of pipes, etc.

Unfortunately, the builders' "experience" has been acquired by the subcontractor organizations -- "Vostoktekmontazh" and "Sibanelektromontazh," "Sibteploizolyatsiya" and others. Many trusts of the subcontractors are in Novosibirsk and Moscow, but there is no one in Barnaul to control them. The kray committee of the trade union representing the workers of the construction and building materials industry (chairman Comrade Takteyev) are practically not interested in the business of the chemical new construction project.

We have serious complaints also against the planning organizations which prepare the technical documents for the combine. They change the drawings and estimates very frequently. The Moscow "Rezinoproyekt" Institute (director Comrade Frolov) has changed 18 sets of drawings of the carbon black plant this year. The Yaroslavl' Affiliate of the institute, headed by Comrade Styskin, is without an end introducing corrections. The frequent change of technical documents costs the state very dearly and is disorganizing the work of the builders. The plan for the control-measurement apparatuses for the roasting plant has been recompiled three times. The combine has ordered new equipment three times, but it is lying as dead freight to this day, even though a million rubles has been paid for it. One can cite many such facts.

The Sverdlovsk workers are proposing to institute public control on all construction sites and the delivery of chemical equipment. We are in complete agreement with them: one cannot organize good work without daily verification. In turn, we feel that it is necessary to establish control also on the planning organizations. The control should be all-encompassing -- from planning to the installation of the equipment. Then it will at once become obvious who is delaying the construction and startup of important chemical new construction projects.

UNLIMITED PRODUCTION POSSIBILITIES OF THE ENTERPRISES IN KOKHTLA-YARVE

[Following is a translation of an article by S. Popov in the Russian-language newspaper Sovetskaya Estoniya (Soviet Estonia), Tallin, 16 Jan 63.]

Representatives of the party organizations of mines, plants, construction projects of the Estonian Shale Basin, cement workers and builders of Kunda gathered in the hall of the House of Culture in order to discuss how best to put into action the decisions of the 22nd Party Congress and of the November Plenum of the Central Committee of the Party.

In the fourth year of the Seven-Year Plan, the plan of gross production was fulfilled ahead of time by the enterprises of Kokhtla-Yarve. The national economy received additional production amounting to hundreds of thousands of rubles. But the possibilities for a further improvement in the work of the enterprises are, as was noted at the conference, truly unlimited.

Whereas the mines of the "Estonslanets" Trust have coped on the whole with the fulfillment of the planned task, many participants and brigades were in debt last year to state. Despite the fact that new machines and mechanisms are being introduced into the mines, rates of growth of labor productivity of the miners are less than the control figures of the Seven-Year Plan. While warmly approving the decisions of the November Plenum of the Central Committee of the Party, the miner delegates in their remarks at the conference spoke about the reasons for the lag and the lost time in the sections and brigades.

The miner of No 8 Mine, Comrade Agalakov, stated on the podium of the conference:

"We are extremely interested to see the city committee of the Party actually and concretely lead the enterprises and the secretaries visit more frequently the mines and faces, and to know better the life of the personnel."

Comrade Agalakov spoke later about the fact that the personnel of the mine did not work badly last year, but that many reserves for production have still not been put into action. The mechanized mining of shale amounts to an insignificant percentage at the mine; the shale is, essentially, being mined by hand. Not all the brigades at the 8th mine are coping with the task. And why? The workers still lose too much time. If a spring should break or a gasket in a machine, there is nothing for replacement and the brigade loses time. To this day, the drill bars are being entwined by a primitive method and their quality suffers as a result of this. The designs of new machines and prop stands are not always successful. The continuous supply of mine trolleys to the workers has not been organized.

The rhythmic operation of the mines is a great reserve in the mining of fuel. But many of these are so far still working in a non-rhythmic manner. These include also No 6 Mine. Its chief, Comrade Petrovitskiy, admitted that the mine is gradually increasing the mechanized mining of fuel. He sees the reason for this in the fact that the UP-3 loading machines have an extremely small capacity and their repair in the shale basin is not organized. Because of this, 30 to 40 percent of the machines in the fleet are idle.

In speaking at the conference, the manager of the "Estonslanets" Trust, Comrade Viylup, admitted that the non-rhythmic operation of the mines is greatly retarding the growth of production. As a rule, at the start of the week, month, and year, there is "stirring" at the mines and the plans are not being fulfilled then. Unfortunately, the delegates did not hear from Comrade Viylup as to how the leadership of the trust is planning to eliminate this great shortcoming. And this is very important. But even during the new year the mines are not fulfilling the planned tasks for shale mining and the shipment of fuel to the Pribaltiyskaya State Regional Electric Power Plant is poorly organized.

The conference paid much attention to problems of production planning. Despite the fact that the norms for planning have been developed and approved, the plans are

frequently compiled without consideration of these norms. The "Estonslanets" Trust frequently changes the plans affecting the wages, which leads to an infringement of the material stimulus of the workers and office personnel.

The mine foreman of No 2 Mine, Comrade Ponomarev, while speaking about the shortages in the planning, noted that they are poorly reflected on the organization of Socialist competition. When there are no firm tasks, the miners do not know which concrete Socialist obligations to undertake. And this leads to formalism in the organization of competition.

"Our miners work good. The annual increase in shale mining is high and the task for an increase in labor productivity has been overfulfilled. And at the same time, the existence of bottlenecks at the technological complex the unfinished shale warehouse and the electric line do not permit the miners to work to the full extent," said the brigade leader of the miners of the "Kohtla" Mine, Comrade Piyk.

"In the coming year the output of chemical production," said the foundryman of the "Kivyli" Combine, Comrade Surov, "will increase considerably. Capacities will be built for the production of formalin and there will be an increase in the output of tannins from shale phenols and of glue resins. However, we are disturbed by the fact that the plan for the output of chemical production is not supported by deliveries of the needed raw materials and products. These problems must be solved even now, without shelving them."

Much was said at the conference about construction matters. Industrial objects and housing are under construction in the city. But the Kokhtla-Yarve Trust has not utilized completely the funds allocated by the state for the capital construction. The chemical shops, No 7 Mine, No 1 cut are being constructed slowly. This does not give the operators a chance to give in time the production that is needed by the national economy.

The secretary of the Party committee of the trust, Comrade Petrov, who participated in the discussions admitted that the leaders of the construction organizations frequently depend on the force of paperwork, instructions and orders and forget about the organizational work among the builders and installers.

Comrade Petrov and the chief of No 6 Mine Construction Administration, Comrade Baryshnikov, told about the incorrect practice of the planning organizations which frequently include in the construction plan objects without planning documents for these. This violates the technology of the construction, leads to a failure in the supply of precast reinforced concrete to the construction projects, and, in the final analysis, prolongs the target dates for the startup of the objects.

The secretary of the Central Committee of the Estonian Party and the chairman of the Bureau of the Central Committee of the Estonian Party in charge of industry, Comrade K. Vayno, spoke at the conference.

A responsible worker in the Central Committee of the Party (Soviet Union), Comrade Strukov, participated in the work of the conference.

The conference adopted a decision which projects ways for improving the work of the Party organizations of the industrial enterprises and construction projects.

A new membership of the city committee of the Party was elected. At the plenum which was held, Comrades A. Kotov, A. Tsyganova, and A. Varkki were elected secretaries of the city committee of the Party.

TECHNICAL PROGRESS IS THE VANGUARD OF THE SEVEN-YEAR PLAN

[Following is a translation of an unsigned article in the Russian-language publication Partiynaya Zhizn' (Party Life), Tashkent, No 11, Nov 62, pp 34--36.]

Recently the Central Committee of the Usbekistan Party discussed the work of the Party organization of the Chirchik Electrochemical Combine in assuring progress in production. The activity of this organization has much that is valuable and instructive which deserves attention. Below is given a brief description of the struggle of the Party organization of the combine for the acceleration of technical progress.

The Chirchik Electrochemical Combine is one of the large and foremost enterprises in the country. The combine is successfully mastering new equipment and internal reserves are being unearthed and put into action. "To work, study, and live in a Communist manner," has become the motto of the entire enterprise and of each worker, engineer, and technician.

The Party and Komsomol members and all the workers of the enterprise have interpreted the decisions of the March Plenum of the Central Committee of the Party as their own affair. They decided to double and triple the efforts in order to increase the output of mineral fertilizers for agriculture and to make their worthy contribution to the fight on the crash front of Communist construction.

The Chrichik chemists warmly supported the remarkable initiative of the workers at the Voskresensk Chemical Combine who issued the call to produce more mineral fertilizers for agriculture. They have re-examined the previously assumed obligations and they decided to fulfill ahead of time the annual plan and to produce additionally enough ammonia to suffice for the production of several thousand tons of mineral fertilizers.

The creative attitude toward labor, the dissatisfaction with that achieved, and the constant research -- this is what characterizes the attitude of people toward production matters. The foremost workers, production innovators, and people of creative labor are actively participating in the march for technical progress. The struggle for technical progress is one of the main problems in the work of the Party organization of the combine.

The mobilization of the personnel in the struggle for the introduction of the new technology, for automation and mechanization of the production processes, organization of new types of production, and the perfection of the technology -- these and many other problems of technical progress are constantly in the center of the attention of the Party organization.

The success is, to a considerable degree, explained by the fact that the Party committee in this work is constantly supported by the Party shop organization, specialists and production innovators. In the development of plans for the introduction of the new technology and organizational-technical measures, the specialists and innovators are, as a rule, recruited.

The commissions for the accomplishment of Party control over the activity of the administration are active at the combine. While widely recruiting for their work public spirited workers, they are deeply studying the reasons which sometimes delay technical progress in the shops and services of the combine -- they take operative measures to eliminate them and they organize active control over the fulfillment of the projected measures.

The trade union and Komsomol organizations of the combine are conducting great work for the further development of technical progress under the leadership of the Party organization. Many good accomplishments can be credited to the headquarters of the crash Komsomol construction project. The council of young specialists is functioning successfully. The Komsomol newspaper Prozhektor (Searchlight) has earned the reputation of a combat organ.

While heading the struggle for technical progress, the Party organization is paying great and constant attention to the propagation of technical knowledge. The combine regularly holds theoretical conferences, lectures, and discussions on problems of the latest achievements of science

and advanced experience. Technical movies enjoy deserved popularity among the chemists.

All this facilitates the development of technical thought and stimulates interest in creative work. Thus, during the past period of the seven-year plan, 53 of the most important measures for the automation and mechanization of production, the application of advanced technology, and 188 organizational-technical measures have been developed.

The public forms of participation of the workers in the perfection of production have played a large role in assuring technical progress at the combine. The general combine council of innovators and inventors is conducting serious work. A public design bureau is operating under the leadership of the council. Thirty overall brigades of innovators and inventors are actively functioning at the combine. At the present every fourth worker of the enterprise is an innovator or inventor.

It is difficult to overestimate the contribution of the innovators to the struggle for technical progress. It is sufficient to say that during the first half of the seven-year plan 3,406 innovation suggestions with a conditional annual saving of over 160,000 rubles have been introduced. And by means of the efforts of the public design bureau, work has been accomplished on 55 subjects with a saving of 145,000 rubles after introduction into production.

A large role has been played by the public and the creative thought of the innovators in the accomplishment of the changeover of the production of nitrogen fertilizers from Bukhara gas. This made it possible to dispense with the use of coal and coke as a fuel, raise labor productivity, and reduce cost of production by 30 percent.

The Chirchik chemists, in collaboration with the scientists, are conducting great scientific research work to create new technological systems which are of actual significance for the development of the chemical industry and other branches of the national economy.

The Party organization came forward as the initiator in affording help to the enterprises under construction and the scientific research organizations of the republic when it assumed patronage of supplying them with experienced specialists.

The Chirchik Electrochemical Combine is justly called the forge of the cadres for the enterprises of the nitrogen industry under construction in Uzbekistan. Here grew up remarkable experts, true innovators, and highly skilled specialists-chemists. The Party organization of the combine, which is showing constant concern for the training of cadres and raising the general educational level and the technical skill of the workers of the combine deserves great merit for this.

At the present time over 2,000 workers are improving their skill without discontinuing work. Three hundred and sixty one people are taking correspondence courses in higher educational institutions, 144 in technical schools, and 166 in evening schools for working youth. The personnel of the advanced enterprise can justly be proud of the fact that every second worker at the combine is studying.

The thirst for knowledge and science characterizes the worker of our days. Here everyone knows well that in order to move technical progress forward and in order to always be an active fighter for the creation of a material-technical base of Communism, it is necessary to study -- study persistently, steadily, and patiently. And it is not an accident that the future plan for raising the general educational and technical level, as developed on the initiative of the Party organization, indicates that by 1965 70 percent of all the workers at the combine will have a secondary and higher education.

The successful accomplishment of technical progress, constant attention toward these problems by the Party committee, and active participation of the entire Party organization have made it possible to improve the indices of the business activity of the enterprise. Thus, during nine months of 1962, there was a considerable increase in the volume of gross production and labor productivity increased greatly.

Now the Party organization is projecting new frontiers in the struggle for technical progress. Special attention is being paid to unsolved problems. In particular, there is talk about compiling plans in accord with the new technology, which would pay greater attention to economic problems in order to unearth the most promising trends of technical progress. It is necessary as well to activate the work of overall mechanization and automation of the individual sections of production, show more concern about

supplying cadres to the experimental-design bureaus for the development of means for automation and mechanization, pay constant attention to increasing the cultural-technical level of all the workers of the enterprise.

Great and complex tasks are facing the personnel of the combine. Their solution depends greatly on the acceleration of technical progress which is by right figuratively called the wings of the seven-year plan. The Party and Komsomol members and all the workers of the enterprise are full of resolution to continue to work in the future with the creative flame in order to make their worthy contribution toward the fulfillment of the historic decisions of the 22nd Party Congress and the Party Program.

1306

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CHEMICAL INDUSTRY AND CHEMIZATION OF ANIMAL HUSBANDRY

[Following is a translation of an article by G. I. Vilesov in the Russian-language publication Zhivotnovodstvo (Animal Husbandry), Moscow, No 1, Jan 63, pp 17--19.]

The problem of protein shortage in animal feed can be completely and rapidly solved only through an expansion of the sowing of pea and feed beans. Here, chemistry should come to the help of agricultural workers. Synthetic urea which is used for industrial purposes and has become a sufficiently low-cost product will come into wide demand in agriculture as a nitrogen fertilizer of high qualities. Recently, urea has found use also as a protein additive to the feed of ruminant animals.

During the last three years a new technology for the production of urea with the liquid recycle of unreacted gases is successfully being developed. Individual stages for the production of urea have anew been developed and organized, including the concentration and purification of the expansion gas which is the raw material for the production of urea, and the evaporation and crystallization of the urea, two-stage distillation of the melt and gases after the synthesis columns; great work has been accomplished on the automation of the production.

Work for enlarging the units for the synthesis of urea, the use of new and more improved processes of individual stages of production, and automation have assured a decrease in the specific capital investments from 30.8 to 20 rubles per ton of annual capacity. During four years of the seven-year plan (including 1962) urea production increased 16 times in comparison with 1958. The sovnarkhozes and industrial enterprises which produce urea are taking measures to reduce its cost. Up to 1960 the purchase price of urea was 200 rubles per ton. In 1960 a new purchase price was established -- 105 rubles.

However, despite the rapid development of urea production in the country, the requirement for this valuable product is far from being satisfied. In order to increase the resources of synthetic substitutes of protein in the feed of ruminants, the author of the present paper, jointly with engineer V. M. Kozin and the scientist-agronomist L. V. Lopatin, suggested as far back as 1959 the use of ammonium bicarbonate as a protein additive to the feed of ruminants. Experiments on feeding young horned cattle with ammonium bicarbonate and urea, which were conducted by the Administration of the Chemical Industry of the Luganskiy Sovnarkhoz from February through May 1959 in the "Rubezhanskiy" Sovkhoz of the Kamenskiy Rayon, have shown that animals which were fed with ammonium bicarbonate showed an average daily weight increase of 652 grams during the experimental period of 103 days and urea gave an increase of 580 grams while the animals from the control group showed an increase of 483 grams. In 1960 the sovkhozes and kolkhozes of Luganskaya Oblast used ammonium bicarbonate to feed 150,000 head of large horned cattle and cows. Unfortunately, the experience of Luganskaya Oblast was not utilized in the agriculture of the Ukrainian SSR at a time when the chemical industry of the Ukraine has unutilized capacities for the production of ammonium bicarbonate.

It is known from literature data that ammonium salts of organic acids (acetic, lactic, butyric) are also good substituents of plant protein, just as urea. But where is one to get these salts or acids in large amounts? It turns out that there are large amounts of organic acids in such feed as beet bagasse and silage. But the bagasse has little protein and phosphorus. The total amount of nitrogen in it is 0.2 percent. When it is stored, fermentation takes place, which leads to a considerable increase in the content of the organic acids, including acetic and butyric, which lower the feed qualities of the bagasse. As a result of the souring, the losses of nutritive substances during storage of the bagasse reach 40 to 50 percent. Fresh bagasse contains 0.03 to 0.04 percent acids; in the acid bagasse, their content increases to 1.5 to 2 percent.

It is known that an excess of acids in the feed has a negative effect on the digestibility of the dry substances. The saturation of the animal organism with organic acids upsets the metabolism, which leads to a drop in the lactescence and fattiness of the milk and a retardation in the growth of the young stock. It is necessary to neutralize the organic acids in the bagasse with ammonia or ammonium

water in order to obtain feed rich in protein. At the suggestion of the Main Administration of the Chemical Industry (author, candidate of technical sciences, I. A. Makarov), the Ukrainian Sovnarkhoz, as far back as November 1961, adopted a decision to conduct production experiments on ammoniation of bagasse and feeding it to young stock of horned cattle. The procedure of treating bagasse with ammonia water and the set-up of the experiments were developed and accomplished jointly with the Uman' Agricultural Institute (candidate of biological sciences, V. P. Koloniy) and the Cherkassy Canning Combine (director G. I. Mglosik).

From 1 December 1961 through 12 March 1962, the sovkhoz of the Cherkassy Canning Combine conducted the first production experiment on the ammoniation of beet bagasse and feeding it to young stock of large horned cattle. The crude beet bagasse contained 1.27 percent of free acids and 0.21 percent nitrogen. After the treatment of the bagasse with ammonia water (15 kg of 25-percent ammonia water per ton of bagasse), the acidity in the bagasse dropped to 0.2 percent, while the nitrogen content rose to 0.49 percent.

The animals received daily 30 kg of bagasse (the experimental group -- bagasse treated with ammonia water, the control group -- the acid bagasse), 5 kg of sugar beets, 3 kg of corn silage, 4 kg of corn stover, 1.8 kg of coarsely ground corn, 70 gm of tricalcium phosphate, 30 gm of Glauber salt, 80 gm of table salt, and 100 mgm of cobalt chloride. The daily ration contained 8.08 feed units and 527 gm of digestible protein, that is, 60 gm per feed unit. The animals of the experimental group, in addition to this, received 230 gm of digestible protein by the addition of ammonia water in the amount of 93 gm per feed unit.

During 90 days of the basic period of the experiment, the animals of the experimental group showed an average daily weight gain of 1186 gms and those of the control group -- 848 gms. The feed consumption per kg of weight gain amounted in the case of the experimental group to 6.8 feed units and in the case of the control group -- 9.5 feed units. After control slaughter, the carcasses from the animals of the experimental group were placed by the evaluation commission in the highest category of nourishment and those from the control group -- in the middle category. The young stock of the experimental group differed from the control group by the following indices: live weight -- 42 kgs, fresh carcass -- 36 kgs, and slaughter yield -- five percent. The addition of ammonia water to the acid bagasse

during the feeding of the young stock of large horned cattle resulted not only in a weight gain but also in a considerable improvement in its quality: with respect to content of flesh -- 3.3 percent, protein -- 1.1 percent, fat -- 2.06 percent, calorific value -- 14 percent and a drop in water content of 2.18 percent in comparison with animals of the control group.

At the end of the experiment the economic indices were estimated. For a bagasse cost of two rubles per ton, one centner of live weight of animals from the experimental group cost 50 rubles and that of the control group -- 65 rubles. If one takes into consideration the difference in the nourishment category and, consequently, the cost of meat at the purchase prices, then the economic effect of the ammoniation of the bagasse will be still more considerable.

The sugar refineries of the UkSSR, North Caucasus, and BSSR are producing annually up to 40 million tons of bagasse but it is consumed inefficiently. Because of the lack of storage space at the establishments, the bagasse is intensively fed to animals during the fourth quarter, but since it is poor in protein, it is rationed at the rate of 50 to 60 kgs per head of cattle per 24 hours (12 to 15 feed units per kg of weight gain). But from an economic viewpoint, feeding with bagasse should be started not earlier than January, and in the fourth quarter use should be made chiefly of after-harvest residues and wastes from field husbandry. For this purpose, it is necessary to find methods of storing the bagasse, preserving it, and enriching it with nitrogen by treatment with ammonia water. Such a method has been found by the Main Administration of the Chemical Industry and the Central Institute of the Sugar Industry (candidate of technical sciences L. Ye. Fleyshman) and has been introduced at the feeding point of the Yagotin Sugar Refinery.

Calculations show that by the ammoniation of 40 million tons of bagasse and the proper organization of its storage, and economic consumption (25 to 30 kgs per head in 24 hours), it is possible to feed about 16 million head of large horned cattle and obtain additionally about six million centners of beef. The population will thereby obtain from 16 million head 28 million centners of meat of improved grade.

In order to treat 40 million tons of bagasse, it is

necessary to have 600,000 tons of ammonia water or 150,000 tons of ammonia. The chemical industry of the country can, without any difficulties, supply the animal husbandry with ammonia water in the required amounts.

The use of ammonia water for the ammoniation of beet bagasse and silage (provided the ammoniation of the feed will be conducted in the fourth and first quarters, i.e., for the fall-winter period) will eliminate the problem of the periodicity of its consumption in agriculture. More than that, the equipment which is used for introducing liquid fertilizers into the soil during the second and third quarters (tank trucks and tanks) will be utilized during the fall for the needs of the animal husbandry.

Ammonia water which is used for the treatment of beet bagasse and silage can completely replace urea. The use of ammonia water, as well as of urea, will make it possible not only to enrich the feed with protein, but also to eliminate the excess acidity of the feed which has a harmful influence on the organism of the animals. The utilization of ammonia water for treating acid bagasse or silage gives the following results: the non-protein or low-protein juicy feed is enriched with nitrogen and becomes a protein feed. The protein content in the feed in this case will be about 100 gms per feed unit of the ration. The excess acids (acetic, butyric) are neutralized and the nitrogen additive in the feed decreases almost twofold in cost in comparison with urea.

However, there are also shortcomings here: ammonia water is not transportable; there is a great partial pressure of ammonia, which at +40° reaches one atmosphere. Storage requires large airtight tanks. During the treatment of the feed there are losses of ammonia. The use of ammonia water requires special measures of care because the ammonia vapors are toxic.

The Main Administration of the Chemical Industry of the Ukrainian Sovnarkhoz is now working on the problem of how to give animal breeders a solution of ammonium salts, which is capable of neutralizing the free organic acids in the feed and make it possible to enrich the beet bagasse with nitrogen to a content of 1 to 1.2 percent which is equivalent to 300 to 400 grams of digestible protein per feed unit. The pressure of the gases above the solution will be six times less than for ammonia water.

For better assimilability of the feed poor in proteins and mineral salts as well as for a more complete conversion of the mineral nitrogen of the urea, ammonia water, or ammonium salts into protein nitrogen, mineral salts containing chlorine, phosphorus, sulfur, cobalt, and other elements can be added to the feed. The metering of mineral salts into the feed should, as a rule, be conducted at animal breeding farms, but the production of the finished nutritive solution for the treatment of the beet bagasse and silage could very expediently be conducted at chemical plants.

Knowing the chemical composition of the nutritive solution and the content of the free acids in the feed, the animal breeders could easily establish the dosage of solution for the treatment of the feed. The nutritive solution will contain urea. It will completely replace urea or ammonia water. The specific capital expenditures per ton of annual capacity of nitrogen in the nutritive solution amount to 26 rubles instead of 45 rubles per ton of nitrogen in the urea. The cost of nitrogen in the nutritive solution will amount to 80 to 85 rubles instead of 120 rubles in the urea.

The production of the nutritive solution could expediently be organized at the nitrogen plants which are being built in accordance with the shortened system for the production of liquid nitrogen fertilizers. On the basis of a balance of the waste carbon dioxide at these plants, 50 percent of the entire production (calculated as fixed nitrogen) can be produced in the form of a nutritive solution (carbon ammoniates).

The present paper examines the problems of supplying animal husbandry with synthetic nitrogen-containing additives to feed -- substitutes of plant protein. During recent years scientists and practicing animal breeders, biologists, and chemists have conducted great work on the study of the biochemical processes which take place in the rumen of ruminating animals in the course of the synthesis of protein from mineral nitrogen. It would be very expedient to conduct work on the accomplishment of similar processes in an apparatus. The indicated task should be solved by biologists and chemists, using their joint efforts.

PRODUCTION INNOVATORS AT ALCOHOL PLANTS

[Following are translation of an article by A. P. Babenko and an article by N. P. Korotenko in the Russian-language publication Spirtovaya Promyshlennost' (Alcohol Industry), Moscow, No 1, Jan 63, pp 27--28.]

Ust'-Kamenogorsk Alcohol Plant

In January of 1962 the plant placed on a stream a brew-rectification shop with an output of 2,000 decaliters of alcohols in 24 hours in place of the previously existing brew-distillation and vat rectification batch apparatuses. The brew-rectification unit is in a separate building, 20 meters from the alcohol plant.

In the space between the buildings of the alcohol plant and the brew-rectification shop, a reinforced concrete brewing tank with a capacity of 80 cm³ was built; in the ground building of this, two stirring mechanisms were installed and an air compressor was erected to drive the thermoregulators of the shop. For convenience in servicing, the fermentation shop of the alcohol plant is connected to the brewing tank by means of a warm, passage gallery.

The economic effect from the introduction of the brew-rectification apparatus and its full operation amounts to 51,000 rubles a year with a recovery period of two years. The technological conditions of the brew-rectification apparatus are maintained by means of self-recording thermometers of the O4-TT-410 thermometers and thermoregulators.

With respect to its indices, the entire rectified alcohol meets the requirements of alcohol of the highest purity.

In order to utilize the carbon dioxide, the plant has placed in operation a carbon dioxide shop with a capacity

of 2.5 tons per 24 hours. The economic effectiveness from the startup of the shop amounts to 27,500 rubles per year and the recovery of the expenditures -- 1.5 years.

At the present time, with a planned output of 550 tons of liquid carbon dioxide a year, the plant will satisfy its demand by 75 enterprises and organizations in nine oblasts of Kazakhstan.

However, the consumption of carbon dioxide in the first and fourth quarters of the year lags behind its production, while in the second and third quarters, it exceeds it.

In order to satisfy the carbon dioxide needs of the consumers during the period of maximum consumption, it is necessary, by the summer months when the plant is shut down for repairs, to create a reserve of carbon dioxide and, besides that, to have a reserve of approximately 2,000 cylinders; for this purpose, it is necessary to supply the consumers and the combine with a sufficient number of cylinders.

Karapchivskiy Alcohol Plant

The Karapchivskiy Alcohol Plant (Chernovitskaya Oblast, UkrSSR) processes molasses in accordance with a two-line system, using phosphoric acid for feeding the yeast. This year work is in progress to install a direct-action, brew-rectification apparatus with a capacity of 2,000 decaliters of absolute alcohol per 24 hours, which will make it possible to increase the plant output by 18 percent. The plant is reconstructing the shop of feed yeast, it is arranging for the distribution of spent grains and liquid feed yeast to the kolkhozes, and the compressor shop is being modernized.

This year the innovators have introduced many valuable suggestions; 65 percent of these have already been introduced into production.

A regulator of water and molasses pressure has been installed, a trap has been installed for catching the fermentation gases from the yeast generators and also a reticulate alcohol filter of plant design, and a separator in the air line of the alcohol stream. All these suggestions give a saving of over 5,000 rubles a year.

The best innovators of the plant are the heat technician N. I. Shul'ga, fitter V. A. Boyko, fitter D. N. Shorodik, apparatus operator I. G. Dobyka, and others. Thanks to the innovators and inventors, there has been an improvement in the technology and the manual labor in supplying materials to a height of 20 meters has been lightened (manual winch has been converted to electric drive).

In order to avoid ruptures in the flange connections in the spent grains line, gland compensators of the "pipe-in-pipe" type have been installed.

The movement of shock workers of Communist Labor has expanded at the plant. Two plant workers, V. A. Boyko and L. P. Kozeguk have been awarded honorable titles.

The personnel of the plant are fighting for the designation of Personnel of Communist Labor.

1306

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TO EXPAND THE PRODUCTION OF NEW GLASS WARES

[Following is a translation of an unsigned article in the Russian-language publication Steklo i Keramika (Glass and Ceramics), Moscow, No 1, Jan 63, pp 43--44.]

In Konstantinovka, in the building of the Scientific Research Institute of the "Avtosteklo" Plant a seminar was held on the problem of expanding the assortment of production and the use of new shapes from glass. Over 200 workers of glass plants, sovnarkhozes, planning and scientific research institutes, as well as representatives of the Gosstroy USSR and UkrSSR, Gosplan UkrSSR, and others participated in the work of the review seminar which was organized by the Gosstroy UkrSSR, Ukrainian Sovnarkhoz, State Institute of Glass, and the Ukrainian Board of the All-Union Society imeni D. I. Mendeleyev.

During the past three to four years many glass construction plants in the Ukrainian SSR made the first step in organizing the production of new types of shapes for the needs of construction.

At the "Avtosteklo," Lisichansk, "Proletariy" Glass Plants have organized the production of facing glazed glass plates to the total amount of 300,000 square meters per year. The "Avtosteklo" Plant is producing glass blocks, window sills, and tempered door plates, reinforced and ornamental glass, and others.

The Glass Plant imeni Oktyabr'skaya Revolyutsiya has developed a unit for the production of pipes 75 to 100 mm and more in diameter, which, as shown by experimental work, can be utilized also for laying outside (underground) water lines; the production of drain pipes has been organized; a plan is under development for the construction of a pilot plant for the production of volumetric shapes of "foam sitall" from flame-liquid slags.

The "Proletariy" Plant has started the commercial production of heat insulation mats of staple glass fiber to the amount of 60,000 cubic meters a year; a unit has been built and placed in operation for the horizontal rolling of sheet ornamental and reinforced glass with a strip width of 1.6 meters.

The Lisichansk Plant is building a shop for the production of glass blocks to the extent of 3.2 million units a year and it is planned to place it in operation in the second half of 1963.

The Bucha Glass Plant is producing glass heat-resistant pipes up to 50 mm in diameter by the method of horizontal drawing. The glass pipes are issued to the consumer complete with the fitting and connecting components, which made it possible during the period of 1961--1962 to mechanize the water supply at more than 900 animal breeding farms of the republic. This plant is building a large-capacity shop which will produce glass pipes of 75 to 100 mm and more in diameter by the method of vertical drawing. It is planned to place the shop in operation in 1963.

The Konstantinovka Plant of Glass Shapes is completing the construction of a complex of shops for the production of different-purpose products (glass matting for hydro-insulation, heat insulating materials, glass plastics, and others) from glass fiber.

However, the initiative shown by the personnel of the glass plants in the organization of the production of new types of shapes from glass for construction needs is not finding sufficient support on the part of the architects and planning organizations of the republic. Besides that, the unsatisfactory participation of these organizations in the development of new shapes from glass is affecting the quality of the shapes.

The glass plants of the Ukrainian SSR could produce enough drain pipes to completely satisfy the requirement of the builders and save hundreds of tons of sheet metal, but the planning organizations do not include the drain pipes in the plans, as a result of which they are being produced only at the Plant imeni Oktyabr'skaya Revolyutsiya and then only in a limited amount. The advantage of these drain pipes over metal ones cannot be disputed.

The deputy chairman of the Gosstroy UkrSSR, G. M.

Baklanov, noted in his introductory remarks that the wide scope of industrial and civilian construction in our country required a considerable increase in the output of building materials.

The architects and builders, while perfecting the building industry and improving the architecture of buildings, require that the building components and facing and insulating materials be more diverse.

Comrade Baklanov noted that glass is now fulfilling not only its original purpose -- covering all windows with glass. It is occupying a greater share at our construction projects and is being used for fencing in walls, producing panels, facing walls outside and inside buildings, for which purpose it is necessary to have a large assortment of new types of shapes made of transparent, colored, superposed, and other glass.

Transparency, high chemical stability, and sufficient mechanical strength make it possible to utilize the shapes of glass in those applications where the use of other building materials is almost entirely excluded or the use of high-cost metal of little resistance against aggressive media is required.

Glass can be used to make diverse building components, heat and sound insulating materials, pipes and shapes for architectural and decorative finishing of buildings and structures. Because of this, glass is finding greater use in the world building practice.

Further, G. M. Baklanov dwelt on the concrete tasks of the glass industry in expanding the assortment and organizing the production of new shapes of glass for construction.

The director of the plant, F. A. Oblival'nyy, read a report about the experience of the Lisichansk Glass Plant in the intensification of processes for the production of construction glass and improving its quality. He told about the work conducted at the plant which made it possible, without the startup of new capacities during the past 10 years, to double the output of glass. At the plant the channels of the furnaces of old construction with successive feeding have been rebuilt for direct feeding. The areas of the tank furnaces have been increased to 316 square meters at the second system and to 276 square meters at the first system. Both tank furnaces have been equipped

with sectional regenerators and are heated by natural gas. The changeover to glassmelting at a temperature of 1,520 to 1,530° and a take-off of 700 to 720 kgs made it possible for the plant to produce glass of high quality (furnace campaign of 23 to 28 months).

The operation of the furnaces at the Lisichansk Plant at high temperatures in the course of three years has convincingly shown the possibility of increasing glass output by 10 to 15 percent by most glass plants without increasing the areas of the glassmelting furnaces with the simultaneous improvement in the quality of the glass.

"At the present time," says F. A. Oblival'nyy, "Dinas shapes from our plant which are produced in accordance with the new technology are in no way inferior to the best brands of French Dinas. We are producing highly tridymitized Dinas -- stable, with a comparatively low porosity and other improved indices." Further, the speaker demonstrates a table of the measurements of the residual thickness of bars after five months of service in the furnace. The results show convincingly that Bakor-20 which is produced by the Yerevan Mullite Plant is of high quality, if one does not consider its poor form, and, with respect to glass resistance, it is not inferior to Corhart which is imported from France.

Bakor-33 which is produced by the Yerevan and Saratov Plants is better than Corhart with respect to glass resistance. "It is necessary through the Gosplan," notes Comrade Oblival'nyy, "to compel these plants to change over to the output of refractories of only the indicated brands. This will make it possible to melt glass at a much higher temperature (1,550 to 1,560°).

Refractories of improved quality, with the correct use of highly calorific natural gas and certain other secondary conditions of the operation of glassmelting furnaces, make it possible even today for many plants to change over to high temperatures.

The chief engineer, Ye. A. Engver, reported about the technical progress and the outlook for the development of the "Proletariy" Plant. Having described the work conducted at the plant in order to introduce the new technology, mechanization and automation of the production processes, he cited detailed figures of a considerable growth of labor productivity, reduction in cost, and rise in the profit-

ability of the plant with respect to the entire assortment of the production.

In conclusion, the speaker told about projected measures for a further increase in production.

The deputy chief engineer, I. G. Gurvits, read a report entitled "New construction materials and shapes of glass in production at the 'Avtosteklo' Plant." The plant director, F. Ye. Zabkov, spoke about the new types of shapes being produced by the Plant imeni Oktyabr'skaya Revolyutisya. The leader of the laboratory of the Institute of Glass, V. A. Ryabov, spoke about strong window glass and the engineer of the "Avtosteklo" Plant, S. A. Skripko, spoke about glass plastic and metal pipes.

In his speech he dwelt in detail on the exploratory-experimental, scientific-technological, and design development being conducted in the Scientific Research Institute of the "Avtosteklo" Plant involving processes for the production of glass plastic and metal pipes, lined with glass. Parallel with the production of lined pipes by the method of blowing a cylinder, the plant is conducting work to find other methods of making pipes and connecting components with an inside glass coating.

The communication of the leader of the laboratory of the Institute for the Utilization of Gas of the Academy of Sciences UkSSR, doctor of technical sciences, N. A. Zakharikov, entitled "Combustion of Natural Gas in Glass-melting Furnaces," was heard with great interest.

The representative of the Institute of Glass, candidate of technical sciences I. A. Tsaritsin, read a report entitled "New types of glass construction blocks." He told in detail about the technology of making two-chamber and colored blocks, which was developed in the institute. In the two-chamber block, the internal space is divided into two sections by means of a thin glass band 100 to 150 microns thick, soldered between the half blocks, which impedes the flow of cold stream of air from the outside wall. Consequently, the heat insulating capacity of the two-chamber block is considerably better than that of a single-chamber block.

A method of making a thin glass film has also been developed in the Institute of Glass. The production of colored glass blocks differs from the production of two-

chamber blocks in that a colored film is used instead of a colorless.

The leader of the laboratory of glass of the Scientific Research Institute of Glass Materials of the Academy of Construction and Architecture of the USSR, V. A. Alekseyev, spoke about the production and use of glass blocks in construction.

The chief engineer of the "Proletariy" Plant, Ye. A. Engver, read a report entitled "Production of staple glass fiber and heat insulating materials therefrom." He told that, because of the technical properties, glass fiber and shapes therefrom are finding wide application as heat, sound, and electric insulating material in different branches of industry and construction (particularly in large-panel construction).

The possibility of the wide use of glass fiber in the national economy is governed by its exceptionally high strength. Thus, the strength of thin glass fiber (diameter of three and less microns) can reach during stretch resistance 3,500 kgs/mm². This is more than twice the strength of steel fibers of corresponding thickness.

At the present time the capacity of the shop of coil and plate materials at this plant has reached 60,000 cubic meters per year.

The seminar also heard reports by D. S. Grebenyuk, entitled "New types of shapes of glass for construction which are being produced by the Konstantinovka Plant of Glass Shapes," by V. A. Dzugayev, entitled "Glass in the architecture of modern buildings," by D. A. Zheleztsov, entitled "'Sitalls' on the basis of modern slags and their use in construction," A. I. Kleus, entitled "Experience in the planning of the production of shapes from 'sitalls' from flame-liquid slags," V. P. Kononko, entitled "Control of annealing of sheet glass," (a paper on this subject was published in No. 12 of 1962 in our journal), M. I. Barsukov, entitled "Glass porcelain and its use in construction and engineering," A. I. Rozhanskiy, entitled "Evaporative cooling of glass-porcelain furnaces" (a paper on this subject was published in No 9 of 1961 in our journal), and others.

Lively discussions developed after the reports. The participants noted the value of the communications, the

urgency of the given seminar and they shared the know-how of their plant, institute, and laboratory. A. P. Patenko -- the chief of the Administration of the Glass and Porcelain-Whiteware Industry of the Kiyevskiy Sovnarkhoz made concrete suggestions for the further modernization of the glassmelting furnaces, for conducting work to strengthen window glass, and about producing uniform glass.

The chief engineer of the "Avtosteklo" Plant, M. I. Koz'min, told about the improvement of the basic unit of glass plants -- glassmelting furnace, tempering of glass, and the organization of mass production of new models of shapes therefrom.

The scientific coworker of the institute, O. V. Vorob'yeva, devoted her speech to the organization of the production of glass covered with oxide films.

Participating in the discussions were also Kur'yanov, Engver, Ul'yanenko, Murakhovskiy, Golubev, Miller, and others.

The participants of the seminar adopted an extensive decision in which it is recommended to increase the assortment and to expand the production of new types of materials of glass.

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